

Example 18**Self Tutor**

\$5000 is invested for 4 years at 7% p.a. compound interest, compounded annually.
What will it amount to at the end of this period? Give your answer to the nearest cent.

$$\begin{aligned}
 PV &= 5000 & FV &= PV \times \left(1 + \frac{r}{100}\right)^n \\
 r &= 7 & &= 5000 \times \left(1 + \frac{7}{100}\right)^4 \\
 n &= 4 & &\approx 6553.98
 \end{aligned}$$

The investment amounts to \$6553.98.

Example 19**Self Tutor**

Calculate the final balance of a \$10 000 investment at 6% p.a. where interest is compounded quarterly for two years.

$$\begin{aligned}
 PV &= 10\,000 & FV &= PV \times \left(1 + \frac{r}{100k}\right)^{kn} \\
 r &= 6 & &= 10\,000 \times \left(1 + \frac{6}{400}\right)^8 \\
 n &= 2 & &\approx 11\,264.93 \\
 k &= 4 & & \\
 \therefore kn &= 8 & &
 \end{aligned}$$

The final balance is \$11 264.93.

Example 20**Self Tutor**

How much interest is earned if €8800 is placed in an account that pays $4\frac{1}{2}\%$ p.a. compounded monthly for $3\frac{1}{2}$ years?

$$\begin{aligned}
 PV &= 8800, \quad r = 4.5, \quad n = 3.5, \quad k = 12 \\
 \therefore kn &= 12 \times 3\frac{1}{2} = 42
 \end{aligned}$$

$$\begin{aligned}
 \text{Now } FV &= PV \times \left(1 + \frac{r}{100k}\right)^{kn} \\
 &= 8800 \times \left(1 + \frac{4.5}{1200}\right)^{42} \\
 &\approx 10\,298.08
 \end{aligned}$$

$$\begin{aligned}
 \text{The interest earned} &= FV - PV \\
 &= 10\,298.08 - 8800 \\
 &= 1498.08
 \end{aligned}$$

The interest earned is €1498.08.

Example 21**Self Tutor**

Holly invests 15 000 UK pounds in an account that pays 4.25% p.a. compounded monthly. How much is her investment worth after 5 years?

To answer this using the TVM function on the calculator, first set up the TVM screen. The initial investment is considered as an outgoing and is entered as a negative value.

There are $5 \times 12 = 60$ month periods.

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TI-84 Plus



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Holly's investment is worth 18 544.53 UK pounds after 5 years.

Example 22**Self Tutor**

How much does Halena need to deposit into an account to collect \$50 000 at the end of 3 years if the account is paying 5.2% p.a. compounded quarterly?

Set up the TVM screen as shown.

There are $3 \times 4 = 12$ quarter periods.

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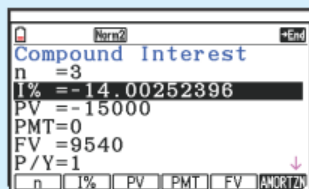
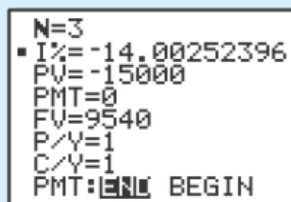
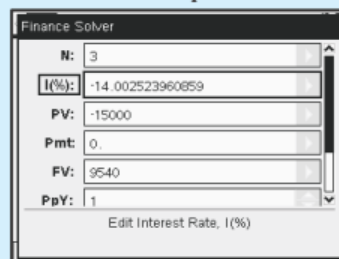


Thus, \$42 821 needs to be deposited.

Example 26**Self Tutor**

A vending machine bought for \$15 000 is sold 3 years later for \$9540. Calculate its annual rate of depreciation.

Set up the TVM screen with $N = 3$, $PV = -15\,000$, $PMT = 0$, $FV = 9540$, $P/Y = 1$, $C/Y = 1$.

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The annual depreciation rate is 14.0%.